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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FERNANDEZ, KALIMAH	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/629,022	DO ET AL.	
	Examiner	Art Unit	
	Kalimah Fernandez	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by US Pat No 6,278,114 issued to Mitsui.

3. Mitsui discloses a source of electrons (col.1, lines 31-33).

4. Mitsui discloses a focusing device positioned proximate to the source of electrons (col.4, lines 11-14).

5. Mitsui discloses the focusing device focusing the electron beam to have a first depth and a second depth of focus (col.3, lines 63-65; col.4, lines 9-14, lines 33-36). Namely, Mitsui discloses varying the depth of focus according the layer of interest (col.3, lines 49-65;col.4, lines 12-14).

6. Mitsui discloses forming at least one representation of the semiconductor corresponding to electrons focused at the first and second depths of focus and impinging on one of more surfaces of the semiconductor device (col.4, lines 24-36; col.4, line 66- col.5, line 6).

7. Mitsui discloses a support (15) (col.1, lines 43-45), wherein Mitsui discloses the use of a typical SEM as described in col. 1, lines 25-45 with the improvement measurement system as in col.2, lines 42-45.

8. As per claim 2, Mitsui discloses the support (15) being movable relative to the electron beam (col.1, lines 43-44).

9. As per claim 11, Mitsui discloses the focusing device focuses the electron beam to have the first depth of focus prior to focusing the electron beam to have the second depth of focus (col.5, lines 34-60).

10. Claims 12-14 are rejected under 35 U.S.C. 102(e) as being anticipated by US Pat No 5,834,783 issued to Muraki et al.

11. Muraki et al disclose a source of electrons (1) (see fig.1).

12. Muraki et al disclose a port surface (3) having a first and second ports therethrough, the first port being positioned proximate to the source to form a first electron beam when the electrons pass therethrough, the second port forming a second electron beam (see fig.1).

13. Muraki et al disclose a first focusing device (301-1) and second focusing device (301-2) (see col.10, lines 13-20).

14. Muraki et al disclose the first beam being focused at a different position than the second beam (col.10, lines 13-25).

15. Muraki et al discloses a support movable in any of the x, y, or z planes (col.8, lines 65-67).

16. As per claims 13-14, Muraki et al discloses the support movable in a direction generally transverse (in the x or y planes) and aligned (in the z-direction) to at least one of the first and second electrons beam (see col.8, lines 65-67; col.21, lines 13-19; fig. 1).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsui '114 and US Pat No 4,600,839 issued to Ichihashi et al.

19. Mitsui discloses the claimed invention except for multiple detectors.

20. However, Ichihashi et al teach the use of multiple detectors (col.3, lines 5-11).

21. It would have been obvious to an ordinary artisan to incorporate the teachings of Ichihashi et al into Mitsui since Ichihashi et al teaches the elimination of certain measurement errors (col.3, lines 8-11).

22. As per claim 5, Ichihashi et al teach a third detector operatively coupled to the support to detect movement of the support, the third detector generating a third signal corresponding to movement detected thereby (col.3, lines 19-22; see fig, 3a-b).

23. As per claim 6, Mitsui teaches a memory device coupled to at least one of the detectors to store the signal generated by the detector (col.5, lines 1-5).

24. As per claim 7, Mitsui teaches a display (col.1, lines 39-40; col.7, lines 25-51). In addition, Ichihashi et al teach a display/monitor (col.3, lines 42-49).

25. As per claim 8, The use of a printing device is deemed obvious in view of the teachings of Mitsui and Ichihashi et al since the use of a printing device is notoriously old in the art. In addition, an ordinary skilled artisan would have obvious motivation to use a printing device since having a printout of the graphical facilitates analysis by enabled to view the graphs in hard copy rather than via the display.

26. Claims 15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraki et al as applied to claim 12 above, and further in view of US Pat No 4,600,839 issued to Ichihashi et al.

27. Muraki et al teach the claimed invention except for the plurality of detector.

28. However, Ichihashi et al teach the use of multiple detectors (col.3, lines 5-11).

29. It would have been obvious to an ordinary artisan to incorporate the teachings of Ichihashi et al into Muraki since Ichihashi et al teaches the elimination of certain alignment measurement errors (col.3, lines 8-11).

30. As per claim 17, Muraki et al teach a memory device (col.23, lines 9-13). In addition, Ichihashi et al teach a memory device (col.5, lines 26-29).

31. As per claim 18, Ichihashi et al teaches the ability to construct a graphical representation of the signal voltage (col.5, lines 15-35).

32. As per claim 19, The use of a printing device is deemed obvious in view of the teachings of Muraki and Ichihashi et al since the use of a printing device is notoriously old in the art. In addition, an ordinary skilled artisan would have obvious motivation to use a printing device since having a printout of the graphical facilitates analysis by enabled to view the graphs in hard copy rather than via the display.

33. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 4,868,395 issued Kasahara et al in view of Muraki '783.

34. Kasahara et al disclose first (10) and second (32) sources of electrons (col.2, lines 25-40).

35. Kasahara et al disclose a first focusing device (12) and second focusing device (32).

36. Kasahara et al disclose focusing the first beam at the surface of the target (col.2, lines 29-35; col.3, lines 49-53).

37. Kasahara et al disclose focusing the second beam on a bottom surface of a target (col.4, lines 1-9).

38. Kasahara et al does not explicitly disclose a support.

39. However, Muraki et al teach the use of x-y-z support (col.9, lines 5-8).

40. It would have been obvious to an ordinary artisan to incorporate the teachings of Muraki into Kasahara et al since Muraki et al teach the advantage of the ability to detect the size and position of the source image and its current (col.9, lines 6-10). An ordinary artisan would obviously be motivated to incorporate the x-y-z support of Muraki since it would enable minimize error.

41. As per claims 21-22, Muraki et al discloses the support movable in a direction generally transverse (in the x or y planes) and aligned (in the z-direction) to at least one of the first and second electrons beam (see col.8, lines 65-67; col.21, lines 13-19; fig. 1).

42. Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al and Muraki as applied to claim 20 above, and further in view of Ichihashi et al ' 839.

43. The obvious motivation of Kasahara and Muraki teaches the claimed invention, whereas Muraki teaches an alignment detector (col.21, lines 4-8) for improved calibration except for a plurality of detector.

44. However, Ichihashi et al teach the use of multiple detectors (col.3, lines 5-11).

45. It would have been obvious to an ordinary artisan to incorporate the teachings of Ichihashi et al into the combination of Kasahara and Muraki since Ichihashi et al teaches the elimination of certain alignment measurement errors (col.3, lines 8-11).

46. As per claim 25, Muraki et al teach a memory device (col.23, lines 9-13). In addition, Ichihashi et al teach a memory device (col.5, lines 26-29).

47. As per claim 26, Ichihashi et al teaches the ability to construct a graphical representation of the signal voltage (col.5, lines 15-35).

48. As per claim 27, The use of a printing device is deemed obvious in view of the teachings of Muraki and Ichihashi et al since the use of a printing device is notoriously old in the art. In addition, an ordinary skilled artisan would have obvious motivation to use a printing device since having a printout of the graphical facilitates analysis by enabled to view the graphs in hard copy rather than via the display.

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat No 5,225,676 issued to Matsuya is considered relevant to claims 1-11. Specifically, Matsya teaches an electron microscope (col.1, lines 6-14).

2. Matsya teaches a source of electrons (6);a focusing device positioned proximate to the source of electrons (col.6, lines 42-50); the focusing device focusing the electron beam to have a first depth and a second depth of focus (col.4, lines 38-43); the ability to form at least one representation of the specimen/ semiconductor corresponding to electrons focused at the first and second depths of focus and impinging on one of more surfaces of the semiconductor device (col.3, lines 12-27; col.11, lines 28-31). Specifically, Matsya teaches an electron microscope, which corrects secondary electron detection problems; therefore Matsya teaches detection of secondary electrons for investigate the topography and morphology of the specimen (see also col.1, lines 6-14).

3. Matsya does not explicitly teach a recited support. However, Matsya teaches varying the position of the specimen/ semiconductor (col. 4, lines 55-59; col.6, lines 27-28; col.9, lines 45-47).

4. In addition, US Pat No 5,412,209 issued to Otaka et al is relevant to claim 1.

5. Otaka et al disclose an apparatus for determining a dimension of a feature of a semiconductor (col.1, lines 5-12); at least one source of electrons (101); a focusing device positioned proximate to the source of electrons (101) to focus electrons emitted by the source and form an electron beam, the focusing device focusing the electron beam to have a first depth (MO) and a second depth of the focus (MH) (col.4, lines 9-18; col. 12, lines 24-44); forming at least one representation of the semiconductor device corresponding to electrons focused at the first and second depths of focus and impinging on one or more surfaces of the semiconductor device (col.6, lines 57-68); and a support (209) aligned with the electron beam and having a support surface engaged the semiconductor device and support the semiconductor (col.12, lines 5-11).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 571-272-2420. The examiner can normally be reached on Mon-Tues 6:30-3:30; Wed-Thurs 8-5 and Fri.9am-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kf

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